

# **Interface between hospital and residential aged care**

**Feasibility study on linking hospital morbidity and residential aged care data**

**August 2003**

Australian Institute of Health and Welfare  
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## Preface

In 2001, the Australian Institute of Health and Welfare (AIHW) independently commenced work on a project aimed at exploring the interface between residential aged care services and the acute hospital sector. The aim was to explore the feasibility of using existing national data collections to address key policy issues in this area. The approach adopted involved the creation of linked databases, undertaken on a probabilistic basis, drawing data from both the national hospital morbidity collection and the residential aged care collection.

Outside the AIHW the recognition of the need to improve the interface between acute hospital care, community care and residential aged care for older people led to the establishment of the Care of Older Australians Working Group by the Australian Health Ministers' Advisory Council (AHMAC). This Working Group developed a substantial work program during 2001.

Late in 2001 the AIHW agreed that the feasibility study being undertaken within the Institute would proceed during 2002 under the auspices of the Care of Older Australians Working Group. It was agreed that the project was directly relevant to the 'Data needs' component of the AHMAC Working Group's work plan, and that the support and expertise of the Working Group would facilitate the timely completion of the feasibility study. This report has been prepared as part of that agreement, and presents preliminary results of the tests which have been undertaken to explore the validity of the AIHW linkage strategy.

The study presented in this report was completed in June 2002 and is based on data for 1999–00. Four other projects were commissioned by the AHMAC Working Group, and it was agreed by Health Ministers that results from four of the five studies would be released together, with the fifth report being released when it has been finalised. Consequently, the publication of this report has been delayed by the need for completion of other projects. Reports from the projects can be found on [www.health.gov.au/minconf.htm](http://www.health.gov.au/minconf.htm).

## **Acknowledgments**

This report was prepared by staff of the Ageing and Aged Care Unit of the Australian Institute of Health and Welfare: Diane Gibson, Evon Bowler, Zhibin Liu and Rosemary Karmel. Peter Braun of the Unit extracted the relevant data from the residential aged care database.

The contributions of two other units within the Australian Institute of Health and Welfare were essential for the completion of this project. The Hospital and Mental Health Services Unit negotiated with the state and territory health authorities for permission to use hospital morbidity data in this study. In addition, Narelle Grayson and Ruth Penm extracted the required data from the hospital morbidity database. The Health Registers and Cancer Monitoring Unit undertook the linkage of the hospital morbidity and residential aged care data extracts. The work of Kate Leeds in this area is especially appreciated.

# Summary of results and recommendations

## Background

The interface between acute hospital care and residential aged care has long been recognised as an important issue in aged care services research. The recognition of the need to improve the interface between acute hospital care, community care and residential aged care in order to ensure that older people receive the most appropriate care led to the establishment of the Care of Older Australians Working Group by the Australian Health Ministers' Advisory Council (AHMAC). During 2001, this Working Group developed a substantial work program.

Despite general recognition of the importance of the relationships between the various care sectors, existing national data provide very poor information on the movements of clients between the residential and acute care sectors. This is not surprising as administrative by-product collections have historically only been designed with regard to the specific program or sub-program which they describe, rather than to provide information on program interfaces or system level information.

In 2001 the Australian Institute of Health and Welfare (AIHW) independently commenced work on a project aimed at exploring statistically the interface between residential aged care services and the acute hospital sector using currently available data. The aim was to explore the feasibility of linking the national hospital morbidity and residential aged care collections and using the resulting linked data set to address key policy issues. Late in 2001, the AIHW agreed that the feasibility study being undertaken within the Institute would proceed during 2002 under the auspices of the AHMAC Care of Older Australians Working Group. This report has been prepared as part of that agreement, and presents results of the tests which have been undertaken to explore the validity of the AIHW linkage strategy.

## Linkage strategy

The absence of patient names in the Institute's national hospital morbidity data precluded data linkage using a statistical linkage key which includes all or part of name. The central hypothesis being tested in this project is whether a linkage key based on variables which include neither name nor part of name can provide a sufficiently robust linkage key to generate a useable linked database on individuals who move from the hospital to the residential care sector, as well as in the reverse direction.

The variables examined for the data linkage process were:

- date of birth (day, month and year);
- sex;

- geographic indicators of place of usual residence prior to admission (postcode and Statistical Local Area (SLA)); and
- date of separation from hospital care matched to date(s) of admission to residential aged care (matching on exact date, and matching on admission date within 3 days of separation date).

Both public and private hospital separations were included in the study.

## **Findings**

Current indications suggest that the statistical linkage process tested in the study successfully generates a set of linked client records which could be used to examine the association between resident characteristics, dependency levels, and patterns of service use in residential aged care, and diagnostic and episode variables, and length of stay in the hospital sector. This linked data should provide a valuable source of information on the client characteristics and service use patterns associated with movements between the two sectors. Because of restrictions applied to the linkage process to avoid false matching, the resulting linked data set is not, however, recommended as a source of information on the size of client flows between the two sectors.

### **Preferred linkage strategy**

Based on the available tests, date of birth, sex, exact separation date/admission date and SLA group of usual residence is the preferred linkage strategy.

In particular, after examining the results for a number of linkage keys, it was found that:

- Using a linkage key based on the three variables ‘date of birth’, ‘sex’ and ‘exact separation date/admission date’ does not allow sufficiently accurate identification of separations from hospital for linking with the residential aged care data. Adding a geographic indicator of client’s usual residence overcomes this problem.
- Postcode provides a marginally lower level of duplicate keys than the much larger SLA group. However, it halves the number of linked records. In choosing SLA group it has been assumed that the postcode variable is too stringent a linkage requirement as it does not allow for slight errors in postcode. In addition, using SLA group facilitates linking records in cases where people enter hospital while being a permanent resident of a residential aged care service.
- The inclusion in the linkage key of a geographic indicator finer than state is not as critical for the states with relatively small populations (Western Australia and smaller) as it is for the larger states. This is because of the smaller number of people involved. For very small states, like Tasmania, the linked sample is quite small, thereby limiting the type of analyses that can be undertaken at the state level.

- While there may be cases where people do not go straight from hospital to residential aged care, allowing hospital separations to be linked with admissions up to 3 days after the separation date increases uncertainty in the validity of identified linkages without greatly increasing the utility of the resulting linked data set.

Using date of birth, sex, exact separation date/admission date and SLA group of usual residence, the linkage strategy generated just over 9,900 linked records for use in cross-sectoral analysis for NSW and ACT. Just over 99% of these records had unique linkage keys. In addition, marital status from the two source data extracts matched in 89% of cases. These findings further support the use of the linkage strategy.

### **Analytical potential**

From the hospital morbidity database, information is available on such matters as patient characteristics, hospital sector, episode type, diagnoses, procedures, Diagnosis Related Group (DRG), and length of stay. The residential aged care data contains information on client characteristics, care needs (via the Resident Classification Scale), and length of stay. In analysis of the combined data the relationship between hospital episodes and residential aged care can be examined. Using the 1999–00 NSW/ACT linked data, some examples of the types of analyses that can be undertaken are presented. Examples incorporating information from other data sources, such as average DRG costs, and residential aged care provision ratios, are also included. While indicative only, the face validity of the results also demonstrate the utility of the linkage strategy.

### **Data development**

Analysis of linked data indicates that the current ‘mode of separation’ data item in the hospital morbidity collection does not provide reliable information on where the patient went following separation from hospital. In addition, the creation of a new variable in the residential aged care collection which indicates where the resident has been admitted from would also provide greatly improved information on client flows between the two sectors. As part of this report the Institute has therefore developed draft data definitions for both of the above items for consideration. Procedures for their implementation are also discussed.

Implementation of these items would:

- (i) provide greatly improved information on the size of client flows between the two sectors; and
- (ii) facilitate statistical linkage by allowing more accurate targeting of the linkage process.

## **Recommendations**

### **Statistical linkage potential**

- Additional validation of the linkage strategy is desirable to provide further confirmation of its utility. If cooperation between Western Australia and the AIHW can be achieved, the accuracy of the linkage strategy can be tested against a 'named' database.
- The linkage strategy using date of birth, sex, exact separation date/admission date and SLA group of usual residence can be used to provide linked data sets to undertake analysis of the interface between hospitals and aged care services. Permission to use data from Victoria and the Northern Territory, and checking that the data necessary for linkage is available in those jurisdictions, is required before national analyses can be undertaken.

### **Data development issues**

There is a general need in the health and aged care systems to recognise the importance of including data items in administrative collections that provide information on program interfaces and also provide indicators of system level performance. The task of providing data at a system level is complex and incremental steps toward that objective should be recognised and where possible implemented.

#### ***Next steps—short to medium term***

- As an important first step toward improving national information on the movements of clients between the residential and acute care sectors, the two data items 'mode of separation' (from hospital), and 'accommodation setting prior to admission to residential aged care' as presented in this report should be implemented. Implementation would require the approval of the National Health Data Committee and the National Health Information Management Group, and consultation with the National Community Services Data Committee.
- The next step would be a more detailed review of the hospital morbidity and residential aged care data sets with a view to identifying additional data developments that would improve the data sets' capacity to report on program interfaces and on system level performance.

#### ***Next steps—longer term***

- A linkage strategy including name, or incorporating a name-based key such as the HACC (Home and Community Care) linkage key, may provide a preferred basis for linkage in the longer term, and attention should be directed towards developing such a capacity. Such a development could also be used to link hospital episodes for people within the hospital sector. However, as in the current study, in any refinement of the linkage process probabilistic matching procedures should be used rather than deterministic methods.

- Many of the issues described above apply to the interface with the community sector (HACC, Community Aged Care Packages) and 'step down' services, and attention should also be directed towards the implications for linkage of data sets across these programs.